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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,730	02/02/2004	Tomohiro Murakami	5000-5142	1015

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EXAMINER	
POPOVIC, BOJAN	
ART UNIT	**PAPER NUMBER**
3709	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/770,730	MURAKAMI ET AL.	
	Examiner	Art Unit	
	Bojan Popovic	3709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/2/04 , 9/27/04 and 4/18/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 7, line 12 of the specification, the word "flown" should be replaced with "flowed".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 1, 3, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 3, 13 and 14 recite the limitation "upstream " in lines 20 and 29 on page 23 and lines 8 and 13 on page 26. Furthermore, claims 3 and 14 recite the limitation "downstream end" in line 29 on page 23 and line 13 on page 26, respectively. There is insufficient antecedent basis for this limitation in the claim. Upstream and downstream portions of the compressor referred to in the above named claims are not defined in the claim language, and it would not be apparent to one of ordinary skill in the art to distinguish the upstream and downstream portions from the claim limitations.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al. (U.S. Patent 4, 127, 363).

Regarding Claims 1 and 2, the Kato et al. reference teaches a compressor with a lubrication structure (Column 1, Lines 39-42) comprising a rotary shaft (Column 2, Line 4), a piston (Column 2, Line 12), a driving body accommodated in a driving body chamber (Column 2, Lines 6 and 8), a gas passage that extends through the rotary shaft and communicates with the driving body accommodating chamber (Column 2, Lines 42-63), an expansion portion in the gas passage (Column 2, Lines 42-63), a fluid passage that radially extends through the rotary shaft to connect the expansion portion with the driving body accommodation chamber (Column 2, Lines 42-55), wherein the maximum cross-sectional area of the expansion portion is greater than the maximum cross-sectional area of the gas passage (Column 2, Lines 42-63). The above mentioned features are illustrated in Figure 1 of the Kato et al. reference.

Regarding Claim 12, the Kato et al. reference teaches a refrigerant containing lubricating oil (Column 2, Lines 16-17).

Regarding Claim 13, the Kato et al. reference teaches a compressor with a lubrication structure, comprising a rotary shaft, a piston, a swash plate accommodated

in a swash plate chamber, a refrigerant passage extending through the rotary shaft, a fluid passage that radially extends in the rotary shaft, and an expansion portion wherein the maximum cross-sectional area of the expansion portion is greater than the maximum cross-sectional area of the refrigerant passage (Column 1, Lines 39-42 and Column 2, Lines 4, 6, 8, 12 and 42-63). The above mentioned features are illustrated in Figure 1 of the Kato et al. reference.

4. Claims 1-4 and 12-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Tarutani et al. (U.S. Patent 6,675,607).

Regarding Claims 1-3, the Tarutani et al. reference teaches a compressor with a lubrication structure (Column 2, Lines 52) comprising a rotary shaft (Column 3, Line 7), a piston (Column 3, Line 21), a driving body accommodated in a driving body chamber (Column 3, Line 35), a gas passage that extends through the rotary shaft and communicates with the driving body accommodating chamber, a tapered expansion portion in the gas passage, a fluid passage that radially extends through the rotary shaft to connect the expansion portion with the driving body accommodation chamber, wherein the maximum cross-sectional area of the expansion portion is greater than the maximum cross-sectional area of the gas passage (Column 4, Lines 15-56). The above mentioned features are illustrated in Figures 1-6 of the Tarutani et al. reference.

Regarding Claim 4, the Tarutani et al. reference teaches a discharge pressure zone, the internal pressure of which is the discharge pressure; a suction pressure zone, the internal pressure of which is the suction pressure (Column 5, Lines 5-7 and 10-14),

and a feed passage connecting the discharge pressure zone with the driving body accommodating chamber (Column 4, Lines 1-3), and a bleed passage connecting the driving body accommodating chamber with the suction pressure zone, wherein the bleed passage functions as the gas passage, wherein the pressure in the driving body accommodating chamber is adjusted by supplying gas in the discharge pressure zone to the driving body accommodating chamber through the feed passage, and bleeding gas in the driving body accommodating chamber to the suction pressure zone through the bleed passage, and wherein a displacement of the compressor is controlled according to the pressure in the driving body accommodating chamber (Column 4, Lines 20-56). The above mentioned features are illustrated in Figures 1 and 3-6 of the Tarutani et al. reference.

Regarding Claim 12, the Tarutani et al. reference teaches a refrigerant containing lubricating oil (Column 4, Lines 29-32).

Regarding Claims 13-15, the Tarutani et al. reference teaches a compressor with a lubrication structure, comprising: a rotary shaft (Column 3, Line 7); a piston (Column 3, Line 21); a swash plate chamber ; a swash plate that is accommodated in the swash plate chamber and supported on the rotary shaft (Column 3, Line 35), wherein the swash plate converts rotation of the rotary shaft into reciprocation of the piston, thereby causing the piston to compress refrigerant, the refrigerant containing lubricating oil; a refrigerant passage extending through the rotary shaft, wherein the refrigerant passage includes an inlet, which communicates with the swash plate chamber, and a tapered expansion portion ; and a fluid passage that formed in the rotary shaft in a

radial direction to connect the expansion portion with the swash plate chamber, wherein the maximum cross-sectional area of the expansion portion is greater than the maximum cross-sectional area of a section of the refrigerant passage that is upstream of the expansion portion. (Column 4, Lines 15-56). Furthermore, the Tarutani et al. reference teaches a discharge pressure zone, the internal pressure of which is the discharge pressure; a suction pressure zone, the internal pressure of which is the suction pressure (Column 5, Lines 5-7 and 10-14), and a feed passage connecting the discharge pressure zone with the driving body accommodating chamber (Column 4, Lines 1-3), and a bleed passage connecting the driving body accommodating chamber with the suction pressure zone, wherein the bleed passage functions as the gas passage, wherein the pressure in the driving body accommodating chamber is adjusted by supplying gas in the discharge pressure zone to the driving body accommodating chamber through the feed passage, and bleeding gas in the driving body accommodating chamber to the suction pressure zone through the bleed passage, and wherein a displacement of the compressor is controlled according to the pressure in the driving body accommodating chamber (Column 4, Lines 20-56). The above mentioned features are illustrated in Figures 1-6 of the Tarutani et al. reference.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-11 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tarutani et al. (U.S. Patent 6,675,607) in view of Fuji et al (U.S. Patent 5,419,685).

Regarding Claim 5, the Tarutani et al. reference teaches a compressor comprising a plurality of cylinder bores arranged around an axis of the rotary shaft, wherein the piston is one of a plurality of pistons each of which is accommodated in one of the cylinder bores, each piston defining a compression chamber in the associated cylinder bore, wherein the compressor further comprises a rotary valve (Column 3, Lines 18-27 and Column 4, Line 13). Although the Tarutani et al. reference does not explicitly teach the expansion portion of a feed passage communicating with the supply passage through a restriction passage; however, it does state that the location of the expansion passage need not be limited with respect to the restriction passage (Column 6, Line 61-63). Since the locations of the restriction and expansion passages are not limited with respect to each other, it is apparent from Figures 1 and 3-6 of the Tarutani et al. reference that the expansion portion may communicate with the supply passage through a restriction passage. The Tarutani et al reference does not teach a compressor comprising a rotary valve that has an inlet passage for drawing gas from the suction pressure zone to the compression chambers, wherein the rotary valve includes a supply passage connecting the inlet passage with the suction pressure zone, and wherein the expansion portion communicates with the supply passage through a restriction passage. The Fuji et al. reference teaches a compressor having a rotary valve with inlet

and suction passageways connecting the suction pressure zone with the compression chambers (Column 9, Lines 29-34, 68-69 and Column 10, Lines 1-4). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use the rotary valve as taught by the Tarutani et al. reference and modify it according to the teachings of the Fuji et al. reference to include the inlet and suction passages connecting the suction zone with the compression chambers.

Regarding Claims 6-11, the Tarutani et al. reference teaches a rotary valve that is coupled to the rotary shaft to integrally rotate with the rotating shaft (Column 4, Lines 12-15). From Figure 1 of the Tarutani et al. reference, it is apparent that the restriction passage is located in the rotary valve. Although the Tarutani et al. reference does not explicitly disclose a shutter having the restriction passage in the rotary shaft, it is apparent that the restriction passage defined by the Tarutani et al. reference (#38 in Figure 1) and the shutter disclosed by the present invention serve the same purpose of restricting the flow of the refrigerant. The restriction passage of the Tarutani et al. reference may be construed as a shutter without deviating from the scope of the invention. The restriction passage and the supply passage of the Tarutani et al. reference function as a bleed passage, providing fluid communication between the intake chamber and the swash plate chamber. The restriction passage of the Tarutani et al. reference is formed in the center portion of the rotary valve, which is located on the axis of the rotating shaft (Column 4, Lines 12-18). Although the Tarutani et al. reference does not teach a rotary valve with an inlet and suction passages, at the time the invention was made, it would be obvious to one of ordinary skill in the art to combine the

teachings of the Tarutani et al. reference with the rotary valve disclosed by the Fuji et al. reference. This combination would not change the scope of the invention, and would function in essentially the same way as the present invention.

Regarding Claim 16, the Tarutani et al. reference teaches a compressor comprising a plurality of cylinder bores arranged around an axis of the rotary shaft, wherein the piston is one of a plurality of pistons each of which is accommodated in one of the cylinder bores, each piston defining a compression chamber in the associated cylinder bore, wherein the compressor further comprises a rotary valve (Column 3, Lines 18-27 and Column 4, Line 13). Although the Tarutani et al. reference does not explicitly teach the expansion portion of a feed passage communicating with the supply passage through a restriction passage; however, it does state that the location of the expansion passage need not be limited with respect to the restriction passage (Column 6, Line 61-63). Since the locations of the restriction and expansion passages are not limited with respect to each other, it is apparent from Figures 1 and 3-6 of the Tarutani et al. reference that the expansion portion may communicate with the supply passage through a restriction passage. The Tarutani et al reference does not teach a compressor comprising a rotary valve that has an inlet passage for drawing gas from the suction pressure zone to the compression chambers, wherein the rotary valve includes a supply passage connecting the inlet passage with the suction pressure zone, and wherein the expansion portion communicates with the supply passage through a restriction passage. The Fuji et al. reference teaches a compressor having a rotary valve with inlet and suction passageways connecting the suction pressure zone with the compression

chambers (Column 9, Lines 29-34, 68-69 and Column 10, Lines 1-4). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use the rotary valve as taught by the Tarutani et al. reference and modify it according to the teachings of the Fuji et al. reference to include the inlet and suction passages connecting the suction zone with the compression chambers.

Regarding Claims 17 and 18, the Tarutani et al. reference teaches a rotary valve that is coupled to the rotary shaft to integrally rotate with the rotating shaft (Column 4, Lines 12-15). Additionally, it is apparent from Figure 1 that the restriction passage (38) is located inside the rotary valve (37). The Tarutani et al. reference does not disclose a rotary valve with both inlet and suction passages; however, as previously noted, the Fuji et al. reference does contain those elements. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the Tarutani et al. compressor with the rotary valve disclosed by Fuji et al. Rotary valves are commonly utilized in the art of swash-plate compressors, and modifying the Tarutani et al. compressor to include Fuji's rotary valve would not deviate from the intended scope of the invention.

Regarding Claims 8 and 19, the Tarutani reference teaches a compressor wherein the rotary shaft has one end at which the expansion portion opens, and the rotary valve has one end at which the restriction passage opens, and wherein the one end of the rotary valve is fitted to the one end of the rotary shaft. As is apparent from Figure 1, the restriction passage (38) opens to the area 38a, and expansion passage (39) is in communication with passage 41. As previously stated, the rotary valve and the

rotating shaft are coupled together (Column 4, Lines 12-16). The Tarutani et al. reference does not disclose a rotary valve with both inlet and suction passages; however, as previously noted, the Fuji et al. reference does contain those elements. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the Tarutani et al. compressor with the rotary valve disclosed by Fuji et al.

Regarding Claim 20, the Tarutani et al. reference teaches a rotary valve that is a part of the rotary shaft (Column 4, Lines 12-16). In Figure 1, the restriction passage (38) is located inside the rotating shaft (16). Although a shutter is not explicitly disclosed, the sides of the restriction passage (38) reduce the overall size of the rest of the passage (41), effectively forming a shutter. The Tarutani et al. reference does not disclose a rotary valve with both inlet and suction passages; however, as previously noted, the Fuji et al. reference does contain those elements. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the Tarutani et al. compressor with the rotary valve disclosed by Fuji et al. and make a compressor having a rotary valve that is part of the shaft, and wherein a shutter with a restriction passage is located in the shaft. This modification would not alter the function of the Tatutani et al. compressor and it also would not deviate from the intended scope of the invention.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fuji et al. (U.S. Patent 5,183,394), Sud et al. (U.S. Patent 6,402,480), and Ishizuka (U.S. Patent 4,401,414) all disclose a central lubrication passage located within the rotating shaft.

Fuji et al. (U.S. Patent 5,419,685) and Fuji et al. (U.S. Patent 5,393,205) disclose a rotary valve arrangement in a swash plate compressor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bojan Popovic whose telephone number is (571) 270-1889. The examiner can normally be reached on Mon-Fri, 8:00AM-5:00PM EST, Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jackson can be reached on (571) 272-4697. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BP
3/29/2007

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4/24/2007